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EXAMINER	
YANG, NELSON C	

ART UNIT	PAPER NUMBER
1641	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/788,414	MIRKIN ET AL.	
	Examiner	Art Unit	
	Nelson Yang	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1,3,4,6-40 and 42-129* is/are pending in the application.

4a) Of the above claim(s) *See Continuation Sheet* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *See Continuation Sheet* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims withdrawn from consideration are 3,4,6,8-13,15,16,18,20,22,28-33,42,43,45,47-51,53,54,56,58,60,66-70,73-79 and 86.

Continuation of Disposition of Claims: Claims rejected are 1,7,14,17,19,21,23-27,34-40,44,46,52,55,57,59,61-65,71,72,80-85,87-92,94-99,110-115 and 117-129.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment of claims 1, 40, 90, 110-112, 120, 123 is acknowledged and has been entered.

2. Applicant's cancellation of claims 2, 41, 130-140 is acknowledged and has been entered.

3. Claims 1, 7, 14, 17, 19, 21, 23-27, 34-40, 44, 46, 52, 55, 57, 59, 61-65, 71, 72, 80-85, 87-92, 94-99, 110-115, 117-129 are currently under examination.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 7, 14, 17, 19, 21, 23-27, 34-40, 44, 46, 52, 55, 57, 59, 61-65, 71, 72, 80-85, 87-92, 94-96, 98, 99, 110-115, 117-129 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mirkin et al. [WO 00/41215] in view of Bernard et al. [US 2002/0098364] and Mirkin et al. [US 2002/0063212].

With respect to claim 1, Mirkin et al. [WO 00/41213] teach a method comprising dip-pen nanolithography (i.e. direct-write lithography) by coating a scanning probe microscope tip with a patterning compound (i.e. providing a tip with a selected protein patterning compound; scanning probe microscope tip), wherein the compound can be a

peptide or protein, and then bringing the coated tip into contact with a substrate to write a pattern (i.e. providing a substrate surface; depositing the selected protein patterning compound from the tip to the substrate surface to produce a pattern) (p. 8, lines 20-32). Mirkin et al. further teach that the tip may be coated with an adhesion layer such that solvents adhere to the tip well (p.7, lines 5-10). Mirkin et al. fail to teach that the adhesion layer is a hydrophilic compound that also inhibits protein adsorption, such as polyethylene glycol, or that the depositing step is carried out with each tip depositing 85 dots per 4 minutes.

Bernard et al., however, teach stamps that have been derivatized with polyethylene glycol (para. 0043), and further teach that these stamps are able to transfer a high amount of compounds such as a catalyst to a substrate even after being stored at ambient conditions for 21 days (para. 0045), while expanding the scope of applications by allowing many types of chemicals to be patterned on a large variety of substrates (para. 0007) reproducibly over days and weeks (para. 0087).

Furthermore, although Mirkin et al. [WO 00/41213] do not specifically teach patterning at a rate of 85 dots per 4 minutes, Mirkin et al. [US 2002/0063212] teaches that dots can be deposited by holding an AFM tip in contact with the substrate surface for 2 seconds (para. 0181), which would allow for a rate of 30 dots per minute, or 120 dots per second, which would allow for faster patterning of the substrate surface, thus allowing for mass production of arrays. One of ordinary skill in the art at the time of the invention would therefore recognize the advantages inherent in patterning at a faster rate. In addition, it has been held that where the general conditions of a claim are disclosed in

the prior art, discovering the optimum or workable ranged involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the tips of Mirkin et al. [WO 00/41213] with a hydrophilic compound such as polyethylene glycol, which would also reduce protein adsorption, in order to be able to transfer a high amount of compounds to a substrate, while allowing many types of chemicals to be patterned on a large variety of substrates reproducibly over days and weeks. It would have further have been obvious to have performed the depositing step at a rate of at least about 85 dots per four minutes per tip, in order to be able to make the arrays faster.

6. With respect to claim 7, Bernard et al. teach coating with polyethylene glycol (para. 0043).

7. With respect to claim 14, Mirkin et al. [WO 00/41213] teach a scanning probe microscope tip (p. 6, lines 15-21).

8. With respect to claims 17 and 19, Mirkin et al. [WO 00/41213] disclose various substrates and patterning compounds comprising peptides and proteins capable of chemisorbing to the substrates (p.8, line 21 - p.9, line 32.

9. With respect to claims 21, 23-25, Mirkin et al. [WO 00/41213] teach dot patterns comprising dots with 0.46 μm diameter (p.21, lines 20-26).

10. With respect to claims 26, 27, Mirkin et al. [WO 00/41213] teach using the tips to print a monolayer of peptides (p.9, lines 19-20), which would have a height of around 8 nm to 10 nm (the size of a protein).

11. With respect to claim 34, Mirkin et al. [WO 00/41213] teach printing of compounds that can comprise both nucleic acids and proteins (p. 9, lines 8-10, 28-32).

12. With respect to claim 35, Mirkin et al. [WO 00/41213] teach that the patterning compound is in a solution comprising a solvent that preferably adheres to the tip very well (p.13, lines 27-32).

13. With respect to claims 36, Mirkin et al. [WO 00/41213] teach that the relative humidity affects the resolution of the lithographic process (p. 17, lines 13-18). Although Mirkin et al. fail to teach that the relative humidity is about 55% to 70%, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranged involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have had a relative humidity of about 55% to 70% to optimize the resolution of the lithographic process.

14. With respect to claim 37, Mirkin et al. [WO 00/41213] teach a scanning probe microscope tip (p. 6, lines 15-21), which is an AFM tip. As discussed above, Bernard further teach derivatizing with polyethylene glycol (para. 0043), which is hydrophilic and thus electrostatically charged.

15. With respect to claim 38, Mirkin et al. [WO 00/41213] teach dot patterns comprising dots with 0.46 μm diameter (p.21, lines 20-26).

16. With respect to claim 39, Mirkin et al. [WO 00/41213] teach that the relative humidity affects the resolution of the lithographic process (p. 17, lines 13-18). Although Mirkin et al. fail to teach that the relative humidity is about 55% to 70%, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the

optimum or workable ranged involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have had a relative humidity of about 55% to 70% to optimize the resolution of the lithographic process.

17. With respect to claims 40, Mirkin et al. [WO 00/41213] teach a method comprising dip-pen nanolithography (i.e. direct-write lithography) by coating a scanning probe microscope tip with a patterning compound (i.e. providing a tip with a selected protein patterning compound; scanning probe microscope tip), wherein the compound can be a peptide or protein, and then bringing the coated tip into contact with a substrate to write a pattern (i.e. providing a substrate surface; depositing the selected protein patterning compound from the tip to the substrate surface to produce a pattern) (p. 8, lines 20-32). Mirkin et al. further teach that the tip may be coated with an adhesion layer such that solvents adhere to the tip well (p.7, lines 5-10). Mirkin et al. fail to teach that the adhesion layer is a hydrophilic compound that also inhibits protein adsorption, such as polyethylene glycol, or that the depositing step is carried out with each tip depositing 85 dots per 4 minutes.

Bernard et al., however, teach stamps that have been derivatized with polyethylene glycol (para. 0043), and further teach that these stamps are able to transfer a high amount of compounds such as a catalyst to a substrate even after being stored at ambient conditions for 21 days (para. 0045), while expanding the scope of applications by allowing many types of chemicals to be patterned on a large variety of substrates (para. 0007) reproducibly over days and weeks (para. 0087).

Furthermore, although Mirkin et al. [WO 00/41213] do not specifically teach patterning at a rate of 85 dots per 4 minutes, Mirkin et al. [US 2002/0063212] teaches that dots can be deposited by holding an AFM tip in contact with the substrate surface for 2 seconds (para. 0181), which would allow for a rate of 30 dots per minute, or 120 dots per second, which would allow for faster patterning of the substrate surface. One of ordinary skill in the art at the time of the invention would therefore recognize the advantages inherent in patterning at a faster rate. In addition, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranged involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the tips of Mirkin et al. [WO 00/41213] with a hydrophilic compound such as polyethylene glycol, which would also reduce protein adsorption, in order to be able to transfer a high amount of compounds to a substrate, while allowing many types of chemicals to be patterned on a large variety of substrates reproducibly over days and weeks. It would have further have been obvious to have performed the depositing step at a rate of at least about 85 dots per four minutes per tip, in order to be able to make the arrays faster.

18. With respect to claims 44, 46, Bernard et al. teach coating with polyethylene glycol (para. 0043), which is resistant to protein binding.

19. With respect to claim 52, Mirkin et al. [WO 00/41213] teach a scanning probe microscope tip (p. 6, lines 15-21), which is an AFM tip.

20. With respect to claims 55, 57, Mirkin et al. [WO 00/41213] disclose various substrates and patterning compounds comprising peptides and proteins capable of chemisorbing to the substrates (p.8, line 21 - p.9, line 32.

21. With respect to claims 59 and 61-63, Mirkin et al. [WO 00/41213] teach dot patterns comprising dots with 0.46 μm diameter (p.21, lines 20-26).

22. With respect to claims 64-65, Mirkin et al. [WO 00/41213] teach using the tips to print a monolayer of peptides (p.9, lines 19-20), which would have a height of around 8 nm to 10 nm (the size of a protein).

23. With respect to claims 71 and 72, Mirkin et al. [WO 00/41213] teach printing of compounds that can comprise both nucleic acids and proteins (p. 9, lines 8-10, 28-32).

24. With respect to claim 80, Mirkin et al. [WO 00/41213] teach patterning antibodies (p. 9, lines 30-32).

25. With respect to claim 81, Mirkin et al. [WO 00/41213] teach that the patterning compound is in a solution comprising a solvent that preferably adheres to the tip very well (p.13, lines 27-32).

26. With respect to claims 82, 83, Mirkin et al. [WO 00/41213] teach that the relative humidity affects the resolution of the lithographic process (p. 17, lines 13-18). Although Mirkin et al. fail to teach that the relative humidity is about 55% to 70%, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranged involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have had a relative humidity of about 55% to 70% to optimize the resolution of the lithographic process.

27. With respect to claims 84, 87, Mirkin et al. [WO 00/41213] teach a scanning probe microscope tip (p. 6, lines 15-21), which is an AFM tip. As discussed above, Bernard further teach derivatizing with polyethylene glycol (para. 0043), which is hydrophilic and thus electrostatically charged.

28. With respect to claim 85, Mirkin et al. [WO 00/41213] teach that the relative humidity affects the resolution of the lithographic process (p. 17, lines 13-18). Although Mirkin et al. fail to teach that the relative humidity is about 55% to 70%, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranged involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have had a relative humidity of about 55% to 70% to optimize the resolution of the lithographic process.

29. With respect to claims 88-89, Mirkin et al. [WO 00/41213] teach that the relative humidity affects the resolution of the lithographic process (p. 17, lines 13-18). Although Mirkin et al. fail to teach that the relative humidity is about 55% to 70%, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranged involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have had a relative humidity of about 55% to 70% to optimize the resolution of the lithographic process.

30. With respect to claim 90, Mirkin et al. teach a method comprising dip-pen nanolithography (i.e. direct-write lithography) by coating a scanning probe microscope tip with a patterning compound (i.e. providing a tip with a selected protein patterning

compound; scanning probe microscope tip), wherein the compound can be a peptide or protein, and then bringing the coated tip into contact with a substrate to write a pattern (i.e. providing a substrate surface; depositing the selected protein patterning compound from the tip to the substrate surface to produce a pattern) (p. 8, lines 20-32). Mirkin et al. further teach that the tip may be coated with an adhesion layer such that solvents adhere to the tip well (p.7, lines 5-10). Mirkin et al. fail to teach that the adhesion layer is a hydrophilic compound that also inhibits protein adsorption, such as polyethylene glycol, or that the depositing step is carried out with each tip depositing 85 dots per 4 minutes.

Bernard et al., however, teach stamps that have been derivatized with polyethylene glycol (para. 0043), and further teach that these stamps are able to transfer a high amount of compounds such as a catalyst to a substrate even after being stored at ambient conditions for 21 days (para. 0045), while expanding the scope of applications by allowing many types of chemicals to be patterned on a large variety of substrates (para. 0007) reproducibly over days and weeks (para. 0087).

Furthermore, although Mirkin et al. [WO 00/41213] do not specifically teach patterning at a rate of 85 dots per 4 minutes, Mirkin et al. [US 2002/0063212] teaches that dots can be deposited by holding an AFM tip in contact with the substrate surface for 2 seconds (para. 0181), which would allow for a rate of 30 dots per minute, or 120 dots per second, which would allow for faster patterning of the substrate surface. One of ordinary skill in the art at the time of the invention would therefore recognize the advantages inherent in patterning at a faster rate. In addition, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranged involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the tips of Mirkin et al. [WO 00/41213] with a hydrophilic compound such as polyethylene glycol, which would also reduce protein adsorption, in order to be able to transfer a high amount of compounds to a substrate, while allowing many types of chemicals to be patterned on a large variety of substrates reproducibly over days and weeks. It would have further have been obvious to have performed the depositing step at a rate of at least about 85 dots per four minutes per tip, in order to be able to make the arrays faster.

31. With respect to claim 91, Bernard et al. teach coating with polyethylene glycol (para. 0043), which is resistant to protein binding.

32. With respect to claims 92, 94, Mirkin et al. [WO 00/41213] teach dot patterns comprising dots with 0.46 μm diameter (p.21, lines 20-26).

33. With respect to claims 95-96, Mirkin et al. [WO 00/41213] teach using the tips to print a monolayer of peptides (p.9, lines 19-20), which would have a height of around 8 nm to 10 nm (the size of a protein).

34. With respect to claims 98, 99, Mirkin et al. [WO 00/41213] teach dot patterns comprising dots with 0.46 μm diameter (p.21, lines 20-26). As discussed above, Bernard further teach derivatizing with polyethylene glycol (para. 0043), which is hydrophilic and resistant to protein adsorption.

35. With respect to claims 110-113, 120 Mirkin et al. [WO 00/41213] teach a method comprising dip-pen nanolithography (i.e. direct-write lithography) by coating a scanning probe microscope tip with a patterning compound (i.e. providing a tip with a selected protein patterning compound; scanning probe microscope tip), wherein the compound

can be a peptide or protein, and then bringing the coated tip into contact with a substrate to write a pattern (i.e. providing a substrate surface; depositing the selected protein patterning compound from the tip to the substrate surface to produce a pattern) (p. 8, lines 20-32). Mirkin et al. further teach that the tip may be coated with an adhesion layer such that solvents adhere to the tip well (p.7, lines 5-10). Mirkin et al. further teach patterning of dot patterns comprising dots with 0.46 μm diameter and spacing of .54 μm (p.21, lines 20-26).

Mirkin et al. fail to teach that the adhesion layer is a hydrophilic compound that also inhibits protein adsorption, such as polyethylene glycol, or that the depositing step is carried out with each tip depositing 85 dots per 4 minutes.

Bernard et al., however, teach stamps that have been derivatized with polyethylene glycol (para. 0043), and further teach that these stamps are able to transfer a high amount of compounds such as a catalyst to a substrate even after being stored at ambient conditions for 21 days (para. 0045), while expanding the scope of applications by allowing many types of chemicals to be patterned on a large variety of substrates (para. 0007) reproducibly over days and weeks (para. 0087).

Furthermore, although Mirkin et al. [WO 00/41213] do not specifically teach patterning at a rate of 85 dots per 4 minutes, Mirkin et al. [US 2002/0063212] teaches that dots can be deposited by holding an AFM tip in contact with the substrate surface for 2 seconds (para. 0181), which would allow for a rate of 30 dots per minute, or 120 dots per second, which would allow for faster patterning of the substrate surface. One of ordinary skill in the art at the time of the invention would therefore recognize the advantages inherent in patterning at a faster rate. In addition, it has been held that where

the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranged involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the tips of Mirkin et al. [WO 00/41213] with a hydrophilic compound such as polyethylene glycol, which would also reduce protein adsorption, in order to be able to transfer a high amount of compounds to a substrate, while allowing many types of chemicals to be patterned on a large variety of substrates reproducibly over days and weeks. It would have further have been obvious to have performed the depositing step at a rate of at least about 85 dots per four minutes per tip, in order to be able to make the arrays faster.

36. With respect to claim 114, Mirkin et al. further teach patterning of dot patterns comprising dots with 0.46 μm diameter and spacing of .54 μm (p.21, lines 20-26).Furthermore, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranged involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention for the spacing to be less than 350 nm, in order to produce a more compact pattern.

37. With respect to claim 115, Mirkin et al. teach further teach patterning of dot patterns comprising dots with 0.46 μm diameter and spacing of .54 μm (p.21, lines 20-26).

38. With respect to claim 117, Mirkin et al. teach a scanning probe microscope tip (p. 6, lines 15-21), which is an AFM tip.

39. With respect to claims 118, 121, 122, Mirkin et al. teach further teach patterning of dot patterns comprising dots with 0.46 μm diameter and spacing of .54 μm (p.21, lines 20-26).

40. With respect to claims 119, Mirkin et al. teach using the tips to print a monolayer of peptides (p.9, lines 19-20), which would have a height of around 8 nm to 10 nm (the size of a protein).

41. With respect to claim 123, Mirkin et al. teach printing an array of 25 dots with each dot printed in 20 seconds (p.21, lines 20-23), but fail to teach that the depositing step is carried out with each tip depositing 85 dots per 4 minutes.

However, although Mirkin et al. [WO 00/41213] do not specifically teach patterning at a rate of 85 dots per 4 minutes, Mirkin et al. [US 2002/0063212] teaches that dots can be deposited by holding an AFM tip in contact with the substrate surface for 2 seconds (para. 0181), which would allow for a rate of 30 dots per minute, or 120 dots per second, which would allow for faster patterning of the substrate surface. One of ordinary skill in the art at the time of the invention would therefore recognize the advantages inherent in patterning at a faster rate. In addition, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranged involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have performed the depositing step at a rate of at least about 85 dots per four minutes per tip, in order to be able to make the arrays faster.

42. With respect to claims 124-127, Mirkin et al. [WO 00/41213] teach further teach patterning of dot patterns comprising dots with 0.46 μm diameter and spacing of .54 μm (p.21, lines 20-26).

43. With respect to claims 128, Mirkin et al. [WO 00/41213] teach printing of compounds that can comprise both two different types of proteins, such as antibodies and enzymes (p. 9, lines 8-10, 28-32).

44. With respect to claims 129, Mirkin et al. [WO 00/41213] teach using the tips to print a monolayer of peptides (p.9, lines 19-20), which would have a height of around 8 nm to 10 nm (the size of a protein).

45. Claim 97 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mirkin et al. [WO 00/41213] in view of Bernard et al. [US 2002/0098364] and Mirkin et al. [US 2002/0063212], as applied to claim 90 above, and further in view of Duffy [US 2002/0028463].

The teachings of Mirkin et al. have been disclosed above and Mirkin et al. additionally teach AFM detection of immobilized substances (p. 3, line 29 – p. 4, line 2, Figure 2A). However, Mirkin fails to teach that the protein is labeled with a fluorophore to analyze the pattern.

Duffy, however, teaches that biomolecules immobilized on an array can be detected by detection techniques known in the art, including fluorescence detection and scanning probe microscopes such as AFM (para. 0113). The courts have ruled that art-recognized equivalence between embodiments provides a strong case of obviousness in substituting one material for another. See MPEP 2144.06:

In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents. In re Ruff, 256 F.2d 590, 118 USPQ 340 (CCPA 1958) (The mere fact that components are claimed as members of a Markush group cannot be relied upon to establish the equivalency of these components. However, an applicant's expressed recognition of an art-recognized or obvious equivalent may be used to refute an argument that such equivalency does not exist.); Smith v. Hayashi, 209 USPQ 754 (Bd. of Pat. Inter. 1980) (The mere fact that phthalocyanine and selenium function as equivalent photoconductors in the claimed environment was not sufficient to establish that one would have been obvious over the other. However, there was evidence that both phthalocyanine and selenium were known photoconductors in the art of electrophotography. "This, in our view, presents strong evidence of obviousness in substituting one for the other in an electrophotographic environment as a photoconductor." 209 USPQ at 759.).

Because Duffy teaches that fluorescence detection, which necessarily requires a fluorophore label, and scanning probe detection are recognized as equivalents applied for the same purpose, and Applicants have notprovided evidence indicating why these two techniques cannot be considered art-recognized equivalents, it would have been obvious to one of ordinary skill in the art to substitute a fluorophore labeled protein for a non-labeled protein, so that the proteins pattern can be optically detected by one of ordinary skill in the art at the time of the invention, such as by fluorescence.

Response to Arguments

46. Applicant's arguments with respect to claims 1, 7, 14, 17, 19, 21, 23-27, 34-40, 44, 46, 52, 55, 57, 59, 61-65, 71, 72, 80-85, 87-92, 94-99, 110-115, 117-129 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

47. No claims are allowed.

48. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson Yang whose telephone number is (571)272-0826. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Shibuya can be reached on (571)272-0806. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

49. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nelson Yang/
Patent Examiner, Art Unit 1641